NASAfacts

ELaNa 41 Mission

Overview

NASA is preparing to launch four small research satellites, known as CubeSats, that were developed by three universities and NASA's Johnson Space Center. The CubeSats, selected through NASA's CubeSat Launch Initiative (CSLI), are flying on the Educational Launch of Nanosatellites (ELaNa 41) mission. The launch of ELaNa 41 will be Astra Space Inc's first operational satellite launch. The company is targeting January 2022 for liftoff of its Rocket 3.3 from Space Launch Complex 46 at Cape Canaveral Space Force Station in Florida.

NASA's Launch Services Program (LSP) has awarded multiple Venture Class Launch Services Demonstration 2 contracts to launch small satellites (SmallSats) to space, including CubeSats, microsats or nanosatellites. The first mission under the contract will lift off from Space Launch Complex 46 at Cape Canaveral Space Force Station in Florida in January 2022. Credits: NASA

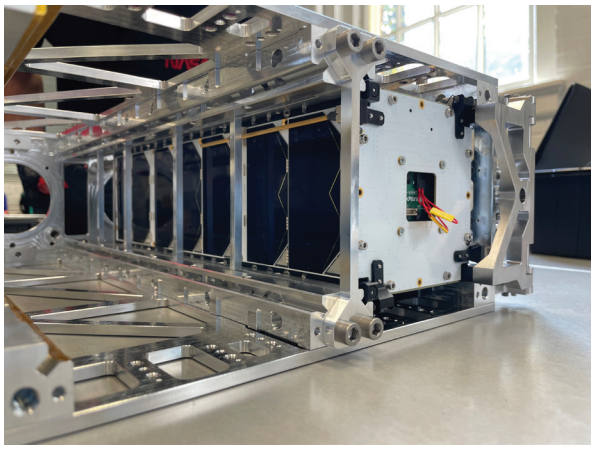
This launch service is provided under a Venture Class Launch Services Demonstration 2 contract, which provides dedicated launch capabilities for smaller payloads, awarded by NASA's Launch Services Program (LSP) based at Kennedy Space Center. NASA's venture class missions help further the development and demonstration of new commercial launch vehicles. These VCLS Demo 2 launches of small satellites can tolerate a higher level of risk than larger missions and will demonstrate – and help mitigate – risks associated with the use of new launch vehicles providing access to space for future small spacecraft and missions.

CubeSats are playing an increasingly larger role in exploration, technology demonstrations, scientific research, and educational investigations at NASA. These miniature satellites provide a low-cost platform for NASA missions, including planetary space exploration; Earth observation; fundamental Earth and space science; and technology demonstrations such as cutting-edge laser communications, energy storage, in-space propulsion, and autonomous movement capabilities. They also provide educators economical means to engage students in all phases of satellite development, operation, and exploitation of collected data through real-world, hands-on research and development experience on NASA-funded rideshare launch opportunities.

CSLI enables the launch of CubeSat projects designed, built, and operated by students, teachers, and faculty, as well as NASA Centers and nonprofit organizations. Managed by LSP, ELaNa missions provide a deployment opportunity or ride-share launch to space for CubeSats selected through CSLI. ELaNa mission managers and their teams provide spaceflight education through the preparation (licensing, integration, and testing) of payloads flown in space. Since its inception in 2010, the initiative has selected over 200 CubeSat missions, over 100 of which have been launched into space, with more than 30 missions scheduled for launch within the next 12 months. The selected CubeSats represent participants from 42 states, the District of Columbia, Puerto Rico, and 102 unique organizations. These miniature satellites were prioritized and selected through a formal NASA review of proposals submitted in response to CSLI announcements. NASA announced its most recent call for proposals on Aug. 9, 2021.

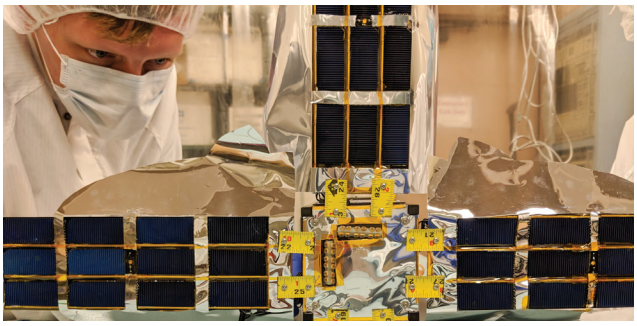
CubeSat Deployment

The following four ELaNa 41 CubeSats will deploy into space from their dispenser atop the upper stage of Astra's Rocket 3.3 launch vehicle.



BAMA-1 - University of Alabama, Tuscaloosa

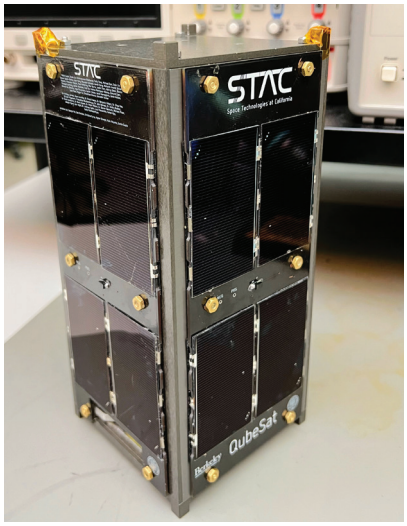
BAMA-1 is a technology demonstration mission that will conduct a flight demonstration of a drag sail module by rapidly deorbiting the satellite. Spacecraft equipped with drag sail technology will be able to deorbit reliably and rapidly, thus reducing space debris and the risk to operational satellites, space stations, and crewed vehicles.



INCA - New Mexico State University, Las Cruces

INCA (Ionospheric Neutron Content Analyzer) is a scientific investigation mission that will study the latitude and time dependencies of the neutron spectrum in low-Earth orbit for the first time to improve current space weather models and mitigate threats to space and airborne assets. The measurements will come from a new directional neutron spectrometer, which is being developed in conjunction with NASA's Goddard Space Flight Center and the University of New Hampshire.

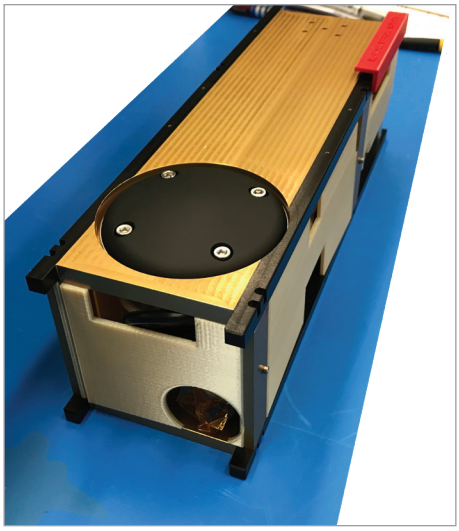
QubeSat - University of California, Berkeley



QubeSat is a technology demonstration mission. It will test and characterize the effects of space conditions on quantum gyroscopes using nitrogen-vacancy centers in diamond. Nitrogen-vacancy centers are nitrogen defect points in diamond with quantum properties that allow scientists to form gyroscopes that measure angular velocity. Nitrogen-vacancy center-based technologies are particularly well suited for space because of their high accuracy, small form factor, and radiation tolerance.

R5-S1 - NASA's Johnson Space Center, Houston

R5-S1 is intended to demonstrate a fast and cost-effective way to build successful CubeSats in addition to demonstrating some technologies that are important to in-space inspection, which could help to make crewed space exploration safer and more efficient. R5-S1 could prove a cheaper way to demonstrate crucial technologies like high-performance computers, cameras, algorithms, and a new way for satellites to transmit pictures to the ground.



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